



# Technical Standard Order

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Subject: AIRCRAFT PORTABLE MEGAPHONES

1. **PURPOSE.** This technical standard order (TSO) prescribes the minimum performance standard that aircraft megaphones must meet in order to be identified with the applicable TSO marking.
2. **APPLICABILITY.** This TSO is effective for new applications submitted after the effective date of this TSO. Major design changes to megaphones approved under this TSO requires a new authorization under this TSO, per 14 CFR 21.611(b).
3. **REQUIREMENTS.** Megaphones that are to be so identified and that are manufactured on or after the effective date of this TSO must meet the minimum performance standards, qualification requirements, and minimum documentation requirements set forth in Society of Automotive Engineers, Inc. (SAE), Aerospace Standard (AS), Document No. AS 4950, "Design and Performance Criteria for Transport Aircraft Portable Megaphones," dated September 1997, as amended by Appendix 1 of this TSO.
  - a. **Environmental Qualification.** The equipment shall be subjected to the test conditions specified in RTCA/DO-160D, "Environmental Conditions and Test Procedures for Airborne Equipment," Change 3, dated May .
  - b. **Deviations.** The FAA has provisions for using alternative or equivalent means of compliance to the criteria set forth in the MPS of this TSO. Applicants invoking these provisions shall demonstrate that an equivalent level of safety is maintained and shall apply for a deviation in accordance with 14 CFR 21.609.
4. **MARKING.** In accordance with 14 CFR 21.607(d), articles manufactured under this TSO must be marked as follows:
  - a. At least one major component must be permanently and legibly marked with all of the information listed in 14 CFR 21.607(d), except for the following: the option provided for in 14 CFR 21.607(d)(2), where the name, type and part number must be used in lieu of the optional model number; and the option provided for in 14 CFR 21.607(d)(3), where the date of manufacture must be used in lieu of the optional serial number.

b. In addition to the requirements of 14 CFR 21.607(d), each separate component that is easily removable (without hand tools), an interchangeable element, or a separate sub-assembly of the article must be permanently and legibly marked with at least the name of manufacturer, manufacturers part number, and the TSO number.

c. Optional marking is permitted to allow aircraft-specific installation limitations, such as the following: **“FOR USE ON (insert aircraft type or serial number) ONLY.”** or **“FOR USE ON AIRCRAFT USED IN PART 91 OPERATIONS ONLY.”**

## **5. DATA REQUIREMENTS.**

a. **Application Data.** In accordance with 14 CFR 21.605(a)(2), the manufacturer must furnish the Manager, Aircraft Certification Office (ACO), Federal Aviation Administration (FAA), having purview of the manufacturer's facilities, one copy each of the following technical data to support the FAA design and production approval:

(1) Operating instructions and equipment limitations. The limitations shall be sufficient to describe the operational capability of the equipment.

(2) Installation procedures and limitations. The limitations shall be sufficient to ensure that a megaphone, when installed in accordance with the installation procedures, continues to meet the requirements of this TSO. The limitations shall also be sufficient to identify any unique aspects of the installation. The limitations also shall include a note with the following statement:

"The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must be approved for installation. The article may be installed only if the installation is performed in accordance with 14 CFR Part 43 or the applicable airworthiness and production requirements."

(3) Schematic drawings as applicable to the installation procedures.

(4) Wiring diagrams as applicable to the installation procedures.

(5) List of the components (by part number) that make up the megaphone system complying with the standards prescribed in this TSO.


(6) Instructions, in the form of a Component Maintenance Manual (CMM) containing information on the periodic maintenance, calibration, and repair for the continued airworthiness of installed megaphones, including recommended inspection intervals and service life.

- (7) Material and process specifications.
  - (8) The quality control functional test specification to be used to test each production article to ensure compliance with this TSO, as required by 14 CFR 21.605(a)(3) and 21.143(a).
  - (9) Manufacturer's TSO qualification test report.
  - (10) Nameplate drawing.
  - (11) A drawing list enumerating all of the drawings and processes that are necessary to define the article's design.
  - (12) An environmental qualifications form as described in RTCA/DO-160D or the most current revision for each component of the system.
- b. Manufacturer Data.** In addition to the data that are to be furnished directly to the FAA, each manufacturer must have available for review by the manager of the ACO having purview of the manufacturer's facilities, the following technical data:
- (1) The functional qualification specifications to be used to qualify each production article to ensure compliance with this TSO.
  - (2) Equipment calibration procedures.
  - (3) Corrective maintenance procedures within 12 months after TSO authorization.
  - (4) Schematic drawings.
  - (5) Wiring diagrams.
  - (6) The results of the environmental qualification tests conducted in accordance with RTCA/DO-160D.

**c. Furnished Data.** One copy of the data and information specified in paragraphs 5.a.(1) through (6) of this TSO and any other data or information that are necessary for the proper installation and use and/or for continued airworthiness of the megaphones must accompany each article manufactured under this TSO.

**6. AVAILABILITY OF REFERENCED DOCUMENTS**

- a. Copies of SAE 4950 may be purchased from the Society of Automotive Engineers, Inc., Department 331, 400 Commonwealth Drive, Warrendale, PA 15096-0001.
- b. Copies of RTCA Document No. DO-160D may be purchased from RTCA, Inc., 1140 Connecticut Avenue, N.W., Suite 1020, Washington, DC 20036.
- c. Federal Aviation Regulations, 14 CFR Part 21, Subpart O, 14 CFR Part 23, 14 CFR Part 25, 14 CFR Part 29, and 49 CFR Part 572 may be purchased from the Superintendent of Documents, Government Printing Office, Washington, DC 20402-9325.
- d. Advisory Circular 20-110 (current revision), "Index of Aviation Technical Standard Orders," and AC 121-6, "Portable Battery-Powered Megaphones," may be obtained from the U.S. Department of Transportation, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785.



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## **APPENDIX 1. MINIMUM PERFORMANCE STANDARD FOR AIRCRAFT PORTABLE MEGAPHONES**

1. Purpose. This appendix prescribes the MPS for megaphones, as modified by the FAA for reference in this TSO.

2. Requirements. The standards applicable to this TSO are set forth in the industry standard specified in paragraph 3 of this TSO. SAE AS 4950, "Aircraft Portable Megaphones," dated September 1997, which is the applicable standard is modified as follows:

### **2.1 Exceptions.**

2.1.1 The information contained in Section 1. SCOPE: and Section 2. REFERENCES: of SAE AS 4950 is duplicative and shall be disregarded.

2.1.2 Disregard Section 6. DATA REQUIREMENTS: and Section 7. NOTES: of SAE AS 4950. Marking of the article shall be in accordance with paragraph 4 of this TSO.

### **2.2 Additions.**

2.2.1 Revise paragraph 3.4.1 of SAE AS 4950 to read as follows: "The device (including packaging) except small parts (knobs, triggers, fasteners, seals, and electrical parts) that would not contribute significantly to the propagation of a fire, must be constructed of materials which are in compliance with 14 CFR 25.853(a) [Appendix F, Part I(a)(1)(iv)] in effect on February 2, 1995.

